Extent estimates of stream quality highlight key stressors influencing fish and macroinvertebrate communities in Waikato streams.

M.A. Pingram[1], M.P. Hamer[1], B.O. David[1], K.J Collier[2]
[1]Waikato Regional Council, [2]University of Waikato

Unbiased estimates of the current ecological state of wadeable, perennial, non-tidal streams on developed land in the Waikato Region, produced using the R package SPSURVEY, reveal that approximately 50% of stream length is considered to have "Poor" water quality and ecological health (based on the macroinvertebrate community present). This is based on a sampling undertaken over 2013 and 2015 summers from a network of approximately 180 "randomly" selected sites. While monitoring originally focused on macroinvertebrate communities, monitoring of fish communities using a standardised methodology has been undertaken at these sites since 2011 to provide an improved and more holistic assessment of ecological stream health regionally. Inferences based on estimates of ecosystem variables indicate that, on average, habitat quality is expected to only be about two-thirds that of native forest streams, with 60% of stream length expected to have no shade from riparian vegetation. Although only 10% of stream length is estimated to have troublesome proliferations of algal growths, around 25% of the stream length is expected to have aquatic plants covering over half of the streambed, with almost all plants being introduced species. The complimentary collection of both response (e.g. fish and macroinvertebrates) and stressor (e.g. habitat water quality) variables allows the estimation of how likely degraded stressor and response conditions are to co-occur at a site. Here we explore the differing co-occurrence of a range of stressor and ecological response variables across developed land sites in the Waikato Region. This analysis of the relative and attributable risk of key stressors on selected ecological response variables has potential implications for regional scale management of ecosystem health.